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What is Claimed is:

1. A mask for lithographic applications of a substrate, said mask comprising magnetic nanoparticles.
- 5 2. A method for producing the mask of claim 1 wherein regions of localized magnetic field maxima define the mask on the substrate.
- 10 3. A method for producing the mask of claim 1 wherein regions of localized magnetic field maxima and a substantially uniform magnetic field define the mask of the substrate.
- 15 4. The method of claim 2 or 3 wherein the regions of localized magnetic field maxima are produced by external magnets.
- 20 5. The method of claim 2 or 3 wherein the regions of localized magnetic field maxima are produced by magnetic bits embedded in the substrate.
- 25 6. The method of claim 2 or 3 wherein the regions of localized magnetic field maxima are produced by magnetic bits located on a surface of the substrate.
- 30 7. The method of claim 2 or 3 wherein the regions of localized magnetic field maxima are produced by magnetic bits programmed to change the position of regions of magnetic field maxima and minima to attract and repel the magnetic nanoparticles of the mask.
8. A method for fabricating a multi-component pattern comprising:

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(a) defining a first set of regions of localized magnetic field maxima and minima on a substrate;

(b) applying magnetic nanoparticles to the substrate so that the magnetic nanoparticles aggregate on the first set
5 of regions of localized magnetic field maxima and avoid regions of localized magnetic field minima;

(c) exposing the substrate to a substrate modifying process to modify sites of the substrate without aggregated magnetic nanoparticles;

10 (d) defining a second set of regions of localized magnetic field maxima and minima on the substrate;

(e) applying magnetic nanoparticles to the substrate so that the magnetic nanoparticles aggregate on the second set of regions of localized magnetic field maxima and avoid
15 regions of localized magnetic field minima;

(f) exposing the substrate to a second substrate modifying process to modify sites of the substrate without aggregated magnetic nanoparticles; and

(g) repeating steps (a) through (f) with additional
20 substrate modifying processes.